

**TECHNICAL OVERSIGHT WORK PLAN
AMERICAN CHEMICAL SERVICE, INC. SITE
GRIFFITH, INDIANA
VOLUME 1 - TECHNICAL SCOPE OF WORK
NOVEMBER 1988**



**Remedial Planning Activities
At Selected Uncontrolled
Disposal Sites**

U.S. EPA Contract No. 68-W8-0089

Roy F. Weston, Inc.

Dames & Moore

Engineers International, Inc.

Life Systems, Inc.

Hubbell, Roth & Clark, Inc.

Reid, Quebe, Allison, Wilcox & Associates, Inc.

Mary Sexton Associates

PERFORMANCE OF REMEDIAL
PLANNING ACTIVITIES AT
UNCONTROLLED SUBSTANCE DISPOSAL
SITES (ARCS REGION V)

U.S. EPA CONTRACT NO. 68-W8-0089

TECHNICAL OVERSIGHT WORK PLAN
AMERICAN CHEMICAL SERVICE INC. SITE
GRIFFITH, INDIANA

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(Vol. 1 - Technical Scope of Work)

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(Vol. 2 - Cost Information)

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SECTION 1

INTRODUCTION

The RI/FS study at the American Chemical Service, Inc. (ACS) Site, Griffith, Indiana is being conducted by the Potential Responsible Parties (PRPs) in response to an Administrative Consent Order with the U.S. Environmental Protection Agency (U.S. EPA). Waryzn Engineering, Inc. has been retained by the PRPs to implement the technical scope of work contained in the Administrative Consent Order.

Roy F. Weston, Inc. (WESTON) is familiar with the site as a subcontractor to Camp, Dresser and McKee, Inc. under the REM II Contract. WESTON has previously participated in the development of the work plan phase documents that were used as the basis for the preparation of the PRP work plan phase documents by Waryzn Engineering, Inc.

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SECTION 2

BACKGROUND

The American Chemical Services site is located in Griffith, Indiana at 420 South Colfax Avenue in Griffith, Indiana. The site includes the American Chemical Services (ACS) facility (19 acres), the inactive portion of the 31-acre Griffith Landfill and the property previously owned by Kapica Drum, Inc. (now owned by Pazmey Corporation, 2 acres). The Chesapeake and Ohio Railroad bisects the site. Review of existing information revealed references to hazardous wastes being disposed of in Griffith Landfill by ACS and there were also references concerning drum and drum cleaning residues from the operation of Kapica Drum, Inc. being disposed of on adjacent to the Kapica Drum property and in the Griffith Landfill and in a cell on the Kapica property.

ACS began operation in May 1955, solely as a solvent recovery firm. Later the company also began a limited chemical manufacturing operation.

From 1955 to at least 1975, ACS disposed of a variety of hazardous wastes at various locations on its property. The hazardous wastes disposed of on ACS property were primarily from on-site chemical manufacturing and solvent reclamation operations. Some waste was accepted from off-site sources for incineration in the ACS on-site incinerator. The incinerator-generated ash was disposed of on ACS property.

Griffith Landfill is still an active sanitary landfill and has been in operation since the 1950's. As stated previously the inactive portion has been included in the Work Plan because it has been reported that hazardous wastes from ACS and Kapica Drum, Inc. were disposed of in the landfill prior to the promulgation of RCRA.

Kapica Drum, Inc. has been in operation since 1951. Kapica Drum, Inc. was a drum reconditioning facility which generated drum residues and rinse water from cleaning drums that contained hazardous wastes. It has been reported that hazardous waste rinsate from drums has been discharged on the ACS and Griffith Landfill property.

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Specific objectives of the RI/FS are:

- Determining if the ACS site poses a risk to public health, welfare and the environment.
- Determining the characteristics of contaminants at the site.
- Defining the pathways of contaminant migration from the site.
- Defining on-site physical features and facilities that could influence contamination migration, containment, or remediation.
- Evaluating and screening remedial action alternatives.
- Recommending the cost-effective remedial action alternative which adequately protects health, welfare and the environment.

SECTION 3

SCOPE OF WORK

This section discusses the scope of work WESTON considers essential for technical oversight assistance for the RI/FS conducted by the PRP at the American Chemical Service, Inc. Site.

The objective is to ensure that the RI/FS meets the statutory requirements of CERCLA, as amended by SARA, and is conducted in accordance with the Administrative Consent Order, RI/FS Work Plan, approved modifications to either of these documents and all applicable U.S. EPA policy and guidance. Technical oversight assistance to be provided by WESTON to U.S. EPA will include the following:

- o Technical oversight of RI field work;
- o Technical review of memoranda/reports submitted to U.S. EPA by PRPs;
- o Participation in Project Meetings;
- o Technical/Financial Management.

These are further discussed in the following subsections.

3.1 TECHNICAL OVERSIGHT OF RI FIELD WORK

Based on a review of Figure 6-1A attached to the September 30, 1988 Statement of Work, the following RI field work tasks have been identified. The phase and task numbers shown are those presented in Figure 6-1A.

| <u>Phase</u> | <u>Task</u> | <u>Duration (Weeks)</u> |
|--------------|---------------------------------------|-----------------------------|
| RI-Phase I | 1C-Geophysical Survey | 1 |
| | 2A-Install perimeter monitoring wells | 2 |
| | 2B-Initial shallow sampling | 7 |
| | 3A-Install and sample leachate wells | 8 |
| | -Soil borings | 8 |
| | -Test pits | 8 |

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| <u>Phase</u> | <u>Task</u> | <u>Duration (Weeks)</u> |
|--------------|--|-----------------------------|
| RI-Phase II | 4A-Install additional shallow monitoring wells | 2 |
| | -Install new lower aquifer monitoring wells | 2 |
| | -Sample monitoring wells | 7 |
| | 4B-Additional soil sampling | 7 |
| RI-Phase III | A-Install additional monitoring wells as necessary | 1 |
| | B-Additional soil sampling as necessary | 5 |
| | C-Additional groundwater samples as necessary | 5 |

Technical assistance will be required for all field activities. WESTON field personnel will act as technical representatives of the U.S. EPA and will be present during all field activities to assure that the work performed at the site is consistent with the Administrative Consent Decree.

One person will be assigned to provide technical oversight of field activities and to coordinate review of plans. This person will be an environmental engineer, chemical engineer, or geologist. Specialists may be assigned to review certain plans or data: for example, a geologist for geophysical data. Technical oversight of RI field work will include the following tasks.

- o Participation in monitoring well location and environmental sampling location decisions.
- o Monitoring wells/piezometer installation oversight.
- o Sampling activity oversight.
- o Audit:
 - custody procedures
 - record keeping procedures
 - on-site field measurement QA/QC procedures

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- o Collect/split samples for the U.S. EPA and arrange for analysis if requested by the RPM.
- o Keep a field log book of observations. Inform the PRP's contractors of any observed deviations from the requirements of the Administrative Consent Decree, Quality Assurance Project Plan, or Health and Safety Plan. Inform the RPM of the site activities and deviations from the required procedures and other problems. Prepare a report of site problems if requested by the RPM.

3.2 TECHNICAL REVIEW OF MEMORANDA/REPORTS

Based on a review of Figure 6-1A and Figure 6-1B, attached to the September 30, 1988 Statement of Work, the following technical memoranda/ reports were identified. The phase and task numbers shown are those presented in Figure 6-1A and 6-1B.

| <u>Phase</u> | <u>Task</u> |
|------------------------------|---|
| RI-Work Plan Phase Documents | A - Modified Work Plan B - Site Specific QAPP C - Sampling and Analysis Plan D - Health and Safety Plan E - Data Management Plan |
| RI-Technical Memoranda | A - Waste Characterization Technical Memorandum B - Soil and Sediment Technical Memorandum C - Surface and Groundwater Technical Memorandum D - Health and Endangerment Technical Memorandum |
| RI-RI Report | A - Draft RI Report B - Final RI Report |
| FS-FS Report | 5 - Draft FS Report - Revised Draft FS Report - Final FS Report |
| FS-Predesign Report | 6 - Predesign Report |

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3.2.1 Review of Planning Documents

As stated in Section 1, WESTON has previously participated in the development of the work plan phase documents that were used as the basis for preparation of the work plan phase documents listed above by the PRP consultant, Waryzn Engineering, Inc. WESTON will review the final work plan phase documents to become familiar with them in order to assure that they are implemented as agreed to in the Administrative Consent Order.

3.2.2 Review of Technical Memoranda/Reports

WESTON will review technical memoranda/RI report for technical accuracy of conclusions made based on the results of field investigations and to ensure that the RI report was written in conformance with the format recommended in the OSWER Directive 9355.3-01.

The draft and final FS report will also be reviewed for technical content and conformance with the format recommended in the OSWER Directive 9355.3-01. The FS report will specifically be reviewed to determine whether alternatives screening, development and detailed evaluations of alternatives and selection of recommended alternative(s) are consistent with the statutory requirement of CERCLA as amended by SARA.

For each document that is reviewed, review comments will be prepared and formally submitted to the U.S. EPA in the form of a technical memorandum or letter. These reports are considered products of the technical oversight work conducted at the ACS site.

3.3 PARTICIPATE IN PROJECT MEETINGS

It is necessary for WESTON to participate in all review meetings between U.S. EPA and the PRP in order to understand agency perspectives for the site and to provide adequate review of the RI/FS technical memoranda/reports. WESTON has assumed that all meetings will be at the U.S. EPA Region V office in Chicago. In addition, WESTON will provide support to the U.S. EPA regarding public meetings.

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3.4 TECHNICAL/FINANCIAL MANAGEMENT AND QUALITY CONTROL

Project Administration encompasses the following subtasks:

- o Technical and financial review
- o Technical and financial reporting
- o Meetings
- o Document Control

3.4.1 Technical and Financial Review

Technical review includes the technical direction and management provided by the Regional Manager and the Site Manager to the site team from project initiation to completion on topics that are not task-specific.

Financial review includes monitoring of budget status, and internal team rebudgeting, as necessary, depending on the level of effort provided by the project team. It also includes monitoring work efforts and forecasting of budget and manpower to schedule the personnel needed for the project.

Two types of monthly progress reports are required. These are:

- o Technical Progress Reports
- o Financial Management Reports

3.4.2 Technical Progress Report

Technical Progress Reports will include the following:

- o Site identification and activity;
- o Status of work tasks and progress to date with percent of completion defined;
- o Difficulties encountered or anticipated during the reporting period;
- o Actions being taken to resolve problem situations;

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- o Key activities to be performed in the next month.

3.4.3 Financial Management Report

The financial management report will include the following:

- o Actual costs for direct labor, expenses and subcontracts expended each month during the reporting period, including fee;
- o Cumulative costs and direct labor hours from contract inception through the reporting period including fee;
- o Projection of costs for completing the project, including an explanation of any significant variations from the planned costs;
- o Projection versus actual expenditures (plus fee) and a comparison of actual versus planned direct labor hours;
- o Projection of costs through completion.

3.4.4 Meetings

Monthly meetings, general and management in nature, will be held between WESTON's site manager and the U.S. EPA Remedial Project Manager to provide progress updates on work being completed at the site and as necessary to revise the future scope of direction of the project.

3.4.5 Document Control

All documents will be filed with proper document numbers according to the guidelines issued by the U.S. EPA and the ARCS document control system.

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3.4.6 Quality Control

Quality Control (QC) measures will be applied to all tasks and subtasks identified within this Work Plan. The ARCS Management Plan and Quality Assurance Program Plan define Quality Control procedures that will be employed. The Site Manager, Regional Manager and Technical Operations Manager are the principal individuals responsible for QC implementation.

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SECTION 4

SCHEDULE AND DELIVERABLES

The schedule for technical oversight assistance is dependant upon submission of deliverables (technical memoranda/reports) to the U.S. EPA by the PRPs and receipt of these deliverables by WESTON from U.S. EPA. WESTON anticipates completion (after receiving copies from U.S. EPA) as follows:

| <u>Report</u> | <u>Review Completion</u> |
|---------------------------|--------------------------|
| Work Plan Phase Documents | 2 weeks |
| Technical Memoranda | 3 weeks |
| Draft RI | 4 weeks |
| Final RI | 2 weeks |
| Draft FS | 4 weeks |
| Revised Draft FS | 2 weeks |
| Final FS | 2 weeks |
| Predesign Report | 4 weeks |

Deliverables for technical RI/FS oversight assistance will consist of formal submission of review comments to the U.S.

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SECTION 5

PROJECT STAFF

An experienced project team has been assembled to effectively meet the needs of technical oversight assistance for the American Chemical Service Inc. Site.

James M. Burton, P.E. will be the Site Manager and is the principal contact for the U.S. EPA RPM. He is familiar with the site and has previously assisted U.S. EPA in the development of the work plan phase documents by the PRP. Mr. Burton will be supported by Mr. Edward A. Need, RPG. and Mr. Bakul Khara, P.E. who are senior level professionals experienced with hazardous waste sites. Mr. Need will be assisted by Project Geologists, Mr. Krumm and Mr. Gnat. Mr. Khara will be assisted by engineers, Mr. Trauger, and Mr. Gilbertsen and Mr. Banaji. These project geologists and project engineers have prior experience in the performance of RI/FS studies at hazardous waste sites.

The profiles of the proposed project personnel are included in Appendix A.

APPENDIX A
PROJECT STAFF PROFILES



James M. Burton, P.E.

Registration

Registered Professional Engineer in the States of Illinois, Missouri, and Pennsylvania.

Fields of Competence

Remedial investigations and feasibility studies; wastewater treatment studies and design; sludge treatment and disposal studies and design; industrial wastewater pretreatment studies and compliance monitoring; municipal and industrial utilities evaluation; construction administration and inspection; wastewater treatment plant start-up assistance and operation; comprehensive wastewater treatment studies; environmental compliance audits.

Experience Summary

Experience with various aspects of hazardous waste remedial investigation and feasibility studies. Experience includes the preparation of sampling and analysis plans; health and safety plans; quality assurance plans; work plans; remedial investigation reports; and feasibility studies.

Experience with various aspects of wastewater treatment and facilities design for a variety of clients. Experience includes design of modification to wastewater treatment facilities; studies of alternative wastewater treatment methods with regard to technical feasibility and cost; studies of alternative sludge treatment and disposal techniques with regard to technical feasibility and cost; design of sludge treatment and disposal facilities; startup assistance and operation training for wastewater treatment facilities.

Other experience includes establishment of an industrial wastewater monitoring and pretreatment program for an industrial client and neighboring municipality. Environmental compliance audits for the U.S. Air Force.

Credentials

B.S., Civil Engineering—University of Missouri, Rolla (1973)

M.S., Civil Engineering—University of Missouri, Rolla (1978)

M.S., Engineering Management—University of Missouri, Rolla (1984)

Certified Class A Wastewater Treatment Plant Operator

National Society of Professional Engineers

Water Pollution Control Federation

American Water Works Association

American Society of Engineering Management

Employment History

| | |
|--------------|-------------------------------|
| 1984-Present | WESTON |
| 1983 | University of Missouri, Rolla |
| 1981-1982 | Metropolitan Engineers, Inc. |
| 1978-1981 | Huth Engineers, Inc. |
| 1975-1978 | Williams and Works, Inc. |

Key Projects

Site manager for two U.S. EPA NPL list-controlled hazardous waste disposal sites. One of the sites was a large (72-acre) landfill located in a complex hydrogeologic setting. Plasticizers, solvents, cadmium and lead sludges, and an estimated 30,000 drums of unknown waste were reported to have been disposed on the site resulting in contaminated surface soil, surface water and groundwater. The second site was a chemical manufacturing and reclamation facility that disposed of a wide variety of chemicals on its property. Responsible for the technical and financial administration of work plans, remedial investigation, and feasibility study plans. Major work items included preparation of sampling and analysis plans; health and safety plans; quality assurance plans; work plans (technical proposal and cost estimate); remedial investigation reports and feasibility studies.

Prepared a remedial investigation report and feasibility study for a U.S. EPA NPL site in northern Wisconsin.

Professional Profile

Two plumes of contaminated groundwater were found beneath the northern section of the city. The leading plume had already contaminated part of the city's municipal well field. The feasibility study evaluated various methods to provide alternative water supplies and to clean up the contaminated groundwater.

Field manager responsible for the execution of all field work necessary for the preparation of remedial investigation reports for a large landfill site in Indiana and a PCB site in Michigan. Also responsible for site personnel safety.

Performed an Engineering Evaluation and Cost Analysis (EECA) for a Superfund site (Carter Industrial Site, Detroit, Michigan). Various remedial technologies evaluated include: rotary kiln incineration, infrared incineration, circulating bed combustion, advanced electrical reactor, in situ nitrification, on-site solidification, on-site RCRA cell. Analyzed cost-effectiveness of alternatives that passed the initial evaluation.

Field manager responsible for the execution of a TCE air stripping pilot study designed to evaluate the feasibility of removing TCE from soil by injecting and extracting heated ambient air. The pilot study was conducted for the U.S. Army.

Conducted environmental compliance audits for five U.S. Air Force bases. Audits involved the review of each base's compliance with applicable state and Federal environmental regulations, including those for air pollution, drinking water, wastewater, and hazardous waste.

Consultant to industrial clients concerning the Federal and state Resource and Conservation and Recovery Act

(RCRA) Hazardous Waste Regulations and RCRA Part B Applications.

Preparation of a sludge disposal study and design of sludge treatment facilities.

Detailed engineering evaluation of the utilities at the New Cumberland Army Depot (water distribution and storage system, domestic and industrial wastewater collection and treatment systems, and storm drainage system).

Preparation of operation and maintenance manuals, operator training and start-up assistance.

Preparation of numerous Federal and state permit and grant applications.

Publications and Presentations

Presentation of seminars and lectures to the Missouri Water and Wastewater Treatment Plant Operators Association.

Presentation of a paper on alternative methods of sludge disposal to the Eastern Section of the Missouri Water and Wastewater Treatment Plant Operators Association.

Instructor of a course on water and wastewater treatment sponsored by the Missouri Department of Natural Resources and Jefferson College.

Instructor for the Pennsylvania Department of Environmental Resources Water Treatment Plant Operators Course and Wastewater Treatment Plant Operators Course.



EDWARD A. NEED, P.G.

Certification

Certified Professional Geologist in the State of Indiana. Licensed Geologist in the State of North Carolina. Registered Professional Geologist in the State of South Carolina. Certified Professional Geologist, American Institute of Professional Geologists.

Fields of Competence

Department management and operations; hydrogeologic studies; site characterization of uncontrolled hazardous waste facilities; groundwater monitoring programs for RCRA permitting; environmental compliance audits; remedial investigation planning; project management; assessment of organic and inorganic groundwater contamination; evaluation of site suitability and permitting for solid and hazardous waste landfills; interpretation of geologic and hydrogeologic conditions relative to civil engineering and construction projects; environmental sampling of groundwater, surface water, soil and sediment.

Experience Summary

Eight years of professional experience involving geological and hydrogeological aspects of environmental and engineering problems with emphasis on CERCLA investigations, RCRA permitting and glacial geology. Responsibilities have included geosciences department management; project management; investigation planning; cost and schedule development and control; field manage-

ment of monitoring well installation and environmental sampling; monitoring well network design; site evaluation; and remedial action development. Projects have involved uncontrolled and/or abandoned waste sites; RCRA-regulated facilities with surface impoundments and landfills; and contamination of soil and groundwater from wastes of wood treating, metal finishing, coal gas manufacture, pigments manufacture, cement manufacture, petrochemical, agricultural supply and foundry industries.

Credentials

B.A., Geology -- Williams College (1978)

M.S., Geology -- University of Wisconsin, Madison (1980)

American Institute of Professional Geologists

Geological Society of America

Association of Groundwater Scientists and Engineers

American Quaternary Association

Employment History

1984-Present WESTON

1981-1984 D'Appolonia Consulting Engineers, Inc./
D'Appolonia Waste Management Services, Inc.

1980-1981 Wisconsin Geological
 and Natural History
 Survey

Key Projects

Geosciences Manager in regional office responsible for staff of 16 hydrogeologists, geologists, geophysicists and geochemists with respect to professional development, project assignments, technical performance and quality control for projects involving CERCLA site investigations, RCRA permitting and groundwater monitoring, and solid waste landfill permitting.

Project Manager and Project Hydrogeologist for RCRA hydrogeologic characterization and groundwater monitoring program at former pigment manufacturing facility in southeastern Kansas. Concluded monitoring not needed due to lack of on-site recharge, attentive capacity of soil and upward gradient from uppermost confined aquifer.

Project Hydrogeologist and Principal Investigator for CERCLA site investigation at abandoned municipal landfill adjacent to major river in north-central Illinois utilizing geophysics, landfill gas surveys, monitoring wells and environmental sampling.

Project Hydrogeologist and Principal Investigator for CERCLA site investigation at closed liquid waste treatment and incineration facility in southwestern Ohio involving complex glacial stratigraphy and multiple perched groundwater system, and on-site management of five-person field investigation team performing a wide range of environmental sampling activities.

Project Hydrogeologist and Project Manager for investigation of possible groundwater contamination of major alluvial aquifer from uncontrolled release of concentrated liquid fertilizer, including setup of a small on-site laboratory, and training of plant staff in laboratory operations and groundwater sampling; also involved negotiation assistance for development of an administrative consent order.

Project Hydrogeologist on multidisciplinary environmental audit team for inspection of a cellophane manufacturing facility, which documented compliance with existing regulations but also had a relatively high potential for future groundwater contamination due to inadequate spill-control structures in organic and inorganic chemical bulk storage areas.

Project Hydrogeologist for preparation of groundwater monitoring section of RCRA Part B permit application at uranium hexafluoride processing facility adjacent to a major river in southern Illinois, involving issues of monitoring seasonally perched water tables and the effects of temporary groundwater flow reversals (caused by flood stages in the river) on the performance of the groundwater monitoring system.

Project Geologist and Project Manager for investigation of heaving problems caused by interaction of clay soils and spilled caustic soda at major chemical manufacturing facility.

Project Hydrogeologist for investigation of surface and groundwater contamination resulting from disposal of cement kiln dust in an abandoned, water-filled quarry.



Bakulesh H. Khara, P.E.

Registration

Registered Professional Engineer in the States of California (Civil Engineer), Florida, Illinois, Texas, and Wisconsin.

Fields of Competence

Project engineering and management in fields of hazardous waste, water, and wastewater. Areas of expertise include investigations, studies, design, construction, and operation of water and wastewater facilities. Remedial investigations and feasibility studies for hazardous waste sites. RCRA and CERCLA compliance evaluations and inspections. Regulations and permitting.

Experience Summary

More than 13 years of engineering and project management experience in environmental engineering, including specific experience in:

Hazardous Waste Management—All aspects of RCRA/CERCLA compliance, including facility investigations, concept engineering, feasibility studies, remedial action programs and design, and permitting.

Water and Wastewater—Design experience includes conceptual design, process selection, plans and specifications, bidding documents, equipment evaluation and selection, plant hydraulics, and cost estimates. Construction experience includes construction management, field inspection, troubleshooting during construction, plant startup assistance, and operation and maintenance manual development. Worked on treatment plants, pumping stations, and pipelines.

Project Management—Managed projects using multidisciplinary staff, including architectural, structural, process, electrical, mechanical, instrumentation, and civil engineering. Experience includes manpower allocation, scheduling, budget control, QA/QC, and coordination with various entities involved in a project.

Credentials

B.E., Civil Engineering—University of Bombay, India (1972)

M.S.C.E., Environmental Engineering—Texas Tech University (1975)

Diplomate, American Academy of Environmental Engineers

American Society of Civil Engineers

Water Pollution Control Federation

American Water Works Association

Employment History

| | |
|--------------|--|
| 1987-Present | WESTON |
| 1978-1987 | PRC Engineering |
| 1975-1978 | Greeley and Hansen Engineers |
| 1973-1975 | Texas Tech University |
| 1972-1973 | Central Public Works Department, India |

Key Projects

Project Manager for a remedial investigation and feasibility study of a Superfund site in Michigan under REM II contract with U.S. EPA.

Project Manager for a facility investigation of a landfill in the Chicago area. The investigation followed the outlines of U.S. EPA's RCRA Corrective Action Plan, and was conducted on behalf of the landfill owner/operator. Provided assistance to the owner/operator in permit application preparations and regulatory compliance activities.

Project Manager for an evaluation of replacement alternatives for existing underground storage tanks for an industrial client in Indiana.

Project Manager for conceptual design and bid specifications for design and construction of hazardous material/waste storage facilities for Illinois Power Company's Clinton Nuclear Power Plant.

Professional Profile

Conducted real estate environmental risk assessment for property transactions.

Provided assistance in completion of feasibility study portion of RI/FS at various sites.

Project Manager for a major national contract with U.S. EPA. Provided technical assistance for enforcement actions at more than 60 hazardous waste sites. Work involved review of documents such as closure plans, remedial investigations, feasibility studies, engineering designs for landfills, comprehensive groundwater monitoring evaluations, oversight of RI/FS, compliance inspections, and Responsible Party searches. Work included both CERCLA and RCRA enforcement actions.

Designed a groundwater remediation program for an industrial client in Michigan. The program included design and operation of a pilot-plant and design of a full-scale plant involving groundwater collection, treatment and recharge, and flushing the site with treated groundwater.

Designed a french-drain trench system to intercept, collect, and contain groundwater from an industrial site in Illinois.

Project Manager for construction services for a 7.5-mgd secondary WWTP, an 8-mgd tertiary WWTP, and various sewer projects for a municipal client in Illinois.

Project Manager for sludge management studies for an 8-mgd WWTP in Iowa and a 64-mgd WWTP in Pennsylvania.

Project Manager for design and specifications for a 3-mgd expansion and improvements for a WWTP in Illinois; and for additions to a 64-mgd WWTP in Pennsylvania. Treatment units included clarifiers, aeration tanks, anaerobic digesters, sludge thickeners and dewatering systems, tertiary filters, nitrification towers, chlorination systems, grit-removal systems, and pumping stations.

Resident Engineer for a two-mile water main for a water authority in Illinois.

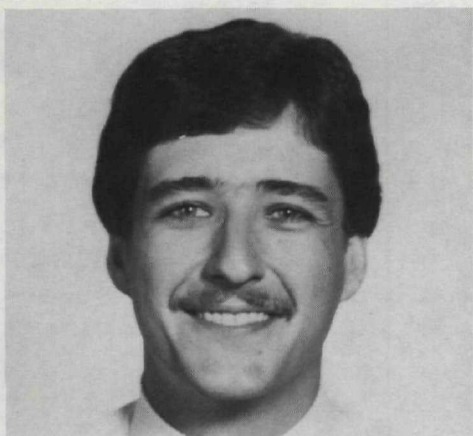
Studied alternative river-level control structures to promote recharge of groundwater aquifer for a city in South Dakota.

Conducted a NPDES permit studies for combined sewer overflows for a county in New York.

Conducted a study of dissolved-oxygen depletion in a 15-mile effluent outfall pipeline for a city in Georgia.

Publications

Thomsen, Kurt O., Bakulesh H. Khara, A.A. Aguwa, "A Collection/Treatment/Recharge/Flushing Groundwater Remediation Program." 7th National Superfund Conference, HMCRI, December 1986.



Richard R. Gnat

Fields of Competence

Geology and hydrogeology with emphasis on groundwater contamination problems; solid and hazardous waste landfill siting; CERCLA regulations dealing with hazardous waste incident investigations; development of short-term and long-term remedial solutions under emergency response conditions; negotiations with Federal and state agencies with respect to proposed actions.

Experience Summary

Over three years of hydrogeologic experience in evaluating and solving groundwater contamination problems. More than one year experience providing emergency response assistance to the U.S. EPA. Involved with numerous RI/FS investigations for government agencies and private sector clients. Extensive experience in landfill siting studies and all aspects of field investigation. Directly involved in the writing of numerous sampling plans and familiar with all U.S. EPA sampling protocol requirements. WESTON Health and Safety Officer for the Midwestern Regional Office.

Credentials

B.S., Earth Science—Northeastern Illinois University (1981)

M.S., Geology—University of Illinois at Chicago (1984)

Additional Hydrogeology Coursework—Eastern Michigan University (1985)

Aquifer Analysis—National Water Well Association (1987)

National Water Well Association

Employment History

| | |
|--------------|-----------------------------|
| 1984-Present | WESTON |
| 1981-1983 | University of Illinois |
| 1981 | Argonne National Laboratory |
| 1980-1981 | Geneva-Pacific Corporation |

Key Projects

Principal Investigator for the Kohler Company Landfill RI/FS in Kohler, Wisconsin. Developed all work plans, executed Phase I field activities which included monitoring well installation, single well testing, environment sampling and development of the Technical Memorandum.

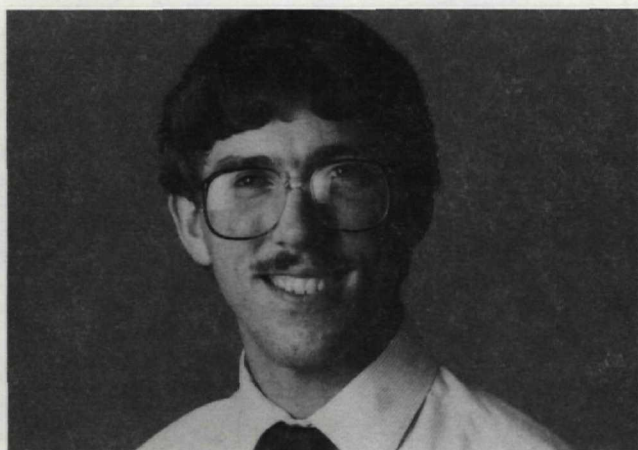
Principal Investigator performing a groundwater quality assessment for a confidential client in Ohio. The study includes an extensive geophysical (EM-34) survey, installation of numerous monitoring wells, waste characterization and groundwater sampling. Primary contact for all state agency negotiations regarding the proposed study.

Team member performing a vadose zone characterization for a confidential client in Southern Illinois. The study entailed a detailed analysis of the unsaturated zone using innovative research techniques. Included in the study was an evaluation of the interaction of high pH pond fluids with underlying clay materials. The study also used a computer groundwater model to evaluate leakage rates and contaminant travel distances with time under varying conditions. Results of the study were used by the client to obtain a double liner exemption permit from the U.S. EPA.

Principal Hydrogeologist in the Powell Road Landfill emergency action study. Work included a large scale industrial survey, residential well sampling, the installation of monitoring wells and the assessment of the potential impact of the landfill on the nearby municipal well field.

Field Team Member and coordinator of two solid waste landfill expansion studies in northern Illinois. Studies include detailed stratigraphic mapping, collection of numerous geotechnical samples, field mapping, bedrock fracture mapping, packer testing of limestone formations and interpretation of all field data. Studies are designed to fulfill all state and Federal regulations and supply all data necessary for proper engineering design of the landfill.

Professional Profile



Christopher W. Krumm

Fields of Competence

Hydrogeologic investigations; assessment of organic and inorganic soil and groundwater contamination; environmental sampling of groundwater, surface water, soil and sediments; analytical chemistry; instrumental analysis of inorganic and organic compounds; petrographic analysis; detection of heavy metals contamination of groundwater and surface water; evaluation of waste contamination or mineralization by geochemistry of soils, sediments, groundwater, and surface water.

Experience Summary

Two years experience in applied hydrogeology, including supervision and installation of environmental monitoring systems; environmental soil, sediment, surface water and groundwater sample collection; environmental data evaluation and management; and hydrogeological site characterizations.

Ten years experience as a quality control analytical chemist in the chemical industry. Experienced with manufacture, purification, and detection of organic and inorganic compounds. Monitored air and water quality and solid waste by-products around chemical plant property. Research experience included the study of a disseminated ore prospect in granitic formations and unconsolidated soils.

Credentials

B.A., Geology and Chemistry—Capital University, Columbus, Ohio (1975)

M.S., Geology and Mineralogy—Ohio State University (1984)

American Chemical Society

Association of Exploration Geochemists

National Water Well Association

Employment History

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|--------------|--------------------------|
| 1986-Present | WESTON |
| 1977-1986 | ASARCO, Inc. |
| 1975-1977 | Chemical Samples Company |

Key Projects

Site supervisor for the installation and sampling of comprehensive environmental monitoring projects which included soil borings; deep and shallow monitoring wells; geophysical well logging; surface geophysical surveys (GPR and electromagnetic); test pit excavation; soil gas surveys; borehole and surface soil sampling; groundwater sampling; surface water sampling; and hydraulic conductivity testing, such as slug and pump tests.

Conducted and participated in environmental assessments of properties for clients participating in real estate transactions.

Participated in environmental sampling of groundwater monitoring wells, surface water, soil borings, surface soils and test pit excavations.

Helped design and implement a data collection and management system using portable and mainframe computers.

Defined the extent and magnitude of groundwater and surface contamination by heavy metals in and around ASARCO, Inc. Zinc Oxide plant in Columbus, Ohio.

Assisted in project to establish statistical product control procedures in ASARCO Zinc Oxide plant operations.

Participated in research projects for the American Society for Testing and Materials for development of ASTM standard procedures.

Evaluated the soil geochemistry of a molybdenum-copper ore prospect near Tonopah, Nevada (Master's Thesis).

Professional Profile



Robert H. Gilbertsen

Registration

Registered Engineer-in-Training in the State of Indiana.

Fields of Competence

Remedial investigation and feasibility study; environmental model development and application; construction inspection; environmental impact assessment; environmental audit; compliance monitoring.

Experience Summary

Experience with various aspects of hazardous waste feasibility studies, including alternative remediation and alternative generation and comparison; predesign report preparation.

Experience in environmental audits includes visual, chemical, and geophysical survey for real estate transaction.

Experience in regulatory compliance includes preparation of hazardous waste disposal unit's sampling and statistical analysis plan.

Experience in environmental impact assessment includes preparation of portions of a report detailing the environmental impact of a high-energy physics research facility.

Other experience includes conceptual and detailed civil engineering design, construction inspection, and environmental permit preparation.

Credentials

B.S., Civil Engineering—Purdue University (1985)

M.S., Environmental Engineering—University of North Carolina (1987)

American Society of Civil Engineers, Secretary of Illinois Section, Environmental Engineering and Water Resources Division

American Water Works Association

National Water Well Association

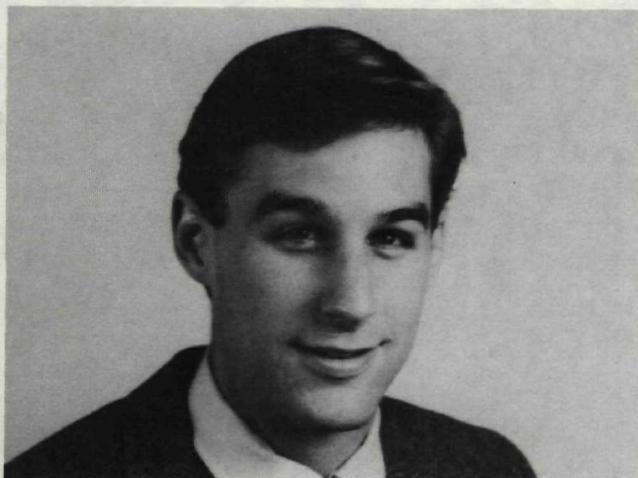
Tau Beta Pi

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Employment History

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|---------------|------------------------------|
| 1988-Present | WESTON |
| 1987-1988 | Harza Environmental Services |
| 1985-1987 | University of North Carolina |
| 1985 (Summer) | M.D. Wessler and Associates |

Professional Profile



Robert J. Trauger

Registration

Registered Engineer-in-Training in the State of Indiana.

Fields of Competence

Engineering design of solid and hazardous waste facilities; solid waste management permitting; municipal water and wastewater treatment; topographical surveying; site investigation and field sampling; hydraulics; preparation of technical reports and permit applications.

Experience Summary

Variety of civil and environmental experience in site investigation, data collection, feasibility studies, and conceptual design. Foremost experience in landfill design and permit application preparation and RI/FS report preparation. Environmental laboratory work; wastewater treatment research; municipal and hazardous waste technology.

Credentials

B.S., Environmental Technology—Cornell University (1985)

M.S., Environmental Engineering—Purdue University (1987)

Water Pollution Control Federation

Employment History

1987-Present WESTON

Key Projects

Project Engineer for municipal landfill expansion permit application. Provided concept design plans and specifications, including surface water management plant, groundwater diversion system, design drawings, closure/post-closure plans and cost estimates, leachate collection system, computer modeling, and report writing/editing.

Project Engineer for feasibility study of a Superfund site. Provided preliminary designs and costs for remedial alternatives, including detailed investigations of hazardous waste landfills and incineration facilities. Assisted in writing and editing of final report.

Provided engineering, administrative, and technical assistance in a RCRA hazardous waste site closure. Duties included remedial design, data management, report writing and editing.

Field experience at several sites, where duties included surveying; groundwater, surface water, soil, and sediment sampling; and engineering reconnaissance.

Provided variety of RI/FS report assistance, including revision editing, data management, and writing.

Professional Profile

Sailesh Banaji

Fields of Competence

Currently working as a Civil/Environmental Engineer with experience in wastewater water supply and hazardous waste engineering. Have experience working on sites sponsored by U.S. EPA to perform Remedial Investigations and Feasibility Studies of Superfund projects. Also worked for two years as a wastewater plant operator at an advanced wastewater treatment facility.

Experience Summary

Experience in hazardous waste management, including site investigations, sampling, and field instrumentation. Implementing health and safety procedures at hazardous waste sites. Experience in remedial investigations/feasibility studies (RI/FS) for state and Federal projects under CERCLA. Experience includes detailed quality assurance project plans (QAPP), work plans, health and safety reports, ARAR and RI/FS reports, data analysis, and selection and design of remedial technologies. Also, experience in municipal wastewater plant operation and analysis of wastewater to meet NPDES standard.

Credentials

Bachelor of Engineering (Civil)
Bangalore University - 1983

M.S. Candidate - Civil Engineering
South Dakota State University
Expected date of graduation - 1988

American Society of Civil Engineers
American Water Works Association
National Society of Professional Engineers

Employment History

| | |
|----------------|---|
| 1988 - Present | WESTON |
| 1987-88 | C.C.Johnson & Malhotra, P.C. |
| 1985-87 | Brookings Municipal Utilities South Dakota |
| 1984-85 | South Dakota State University |

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Professional Profile

Key Projects

Conducted field activities at several Region V REM II and REM V (Superfund) hazardous waste sites. Activities included mobilization, site assessment, and field monitoring/sampling of all types of media.

Assisted in the Remedial Investigation/Feasibility Study of a 35-acre REM V site in Wisconsin. Responsibilities included ISER, QAPP, health and safety plan and, work plan preparation. Also assisted in site mobilization for Remedial Investigation and field sampling.

Member of RI/FS team for a REM II Superfund landfill site in Ohio. Responsibilities included screening of remedial actions, and preparation of the Request for ARARS document and the Feasibility Study for a complex 28 acre municipal, industrial landfill.

Worked as a wastewater plant operator at a 3 MGD Advanced Wastewater Treatment Facility. Was responsible for day-to-day operation of the plant on eight hour shifts of various treatment units. This included monitoring the wastewater and sampling to meet EPA discharge standards, which involved laboratory analysis.

Additional responsibilities assigned were preparing an Annual Technical Report for the City of Brookings Utilities Board by collecting data and coordinating between various city utility departments.